REMARKS

I. Introduction

At the time of the Office Action dated September 20, 2005, claims 1-21 were pending in this application. All the claims stand rejected.

In this Amendment, claims 1, 2, 11 and 12 have been amended, claims 3 and 13 have been canceled, and new claims 22 and 23 have been added. Care has been exercised to avoid the introduction of new matter. Specifically, claim 1 has been amended to include part of limitations of claims 2 and all the limitations recited in claim 3. Claim 11 has also been amended to include part of limitations recited in claim 12 and all the limitations recited in claim 13. Adequate descriptive support for new claims 22 and 23 can be found in, for example, Fig. 3B and relevant description of the specification.

II. Claim Objection

Claims 12 and 13 have been objected to because the recitation "the plasma chamber" in line 5 of claim 12 should be replaced with --the sample chamber--. In amending claim 12, the recitation "the plasma chamber" has been deleted. Withdrawal of the objection to claims 12 and 13 is respectfully solicited.

III. The Rejection of Claims 1-3 and 6-8 under 35 U.S.C. §103(a)

Claims 1-3 and 6-8 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of Carpenter et al. In the statement of the rejection, the Examiner admitted that the AAPA does not expressly teach that the protection tube is composed of a plurality of pieces. However, the Examiner applied Carpenter et al., and

asserted that the reference teaches the missing feature of the AAPA. The Examiner, thus, concluded that it would have been obvious to modify the AAPA based on the teachings of Carpenter et al. to arrive at the claimed invention. It is noted that the rejection of claim 3 has been rendered moot by cancellation of the claim.

In response, Applicants first emphasize that the applied combination of the AAPA and Carpenter et al. does not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 1, as amended. Specifically, the applied combination does not teach, among other things, that the protection tube comprises "a plurality of pieces formed in relation to a distribution of temperatures in the plasma chamber," and "each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures at the time of the plasma processing is smaller," as recited in independent claim 1. Thus, these limitations structurally define a plasma processing apparatus in which the axial length of each piece of the protection tube is defined by the gradient temperatures of the chamber at the time of the plasma processing.

Turning to the prior art, as admitted by the Examiner, the AAPA does not teach the protection tube recited in independent claim 1. The secondary reference, Carpenter et al., discloses a deposition processor chamber liner apparatus comprising a plurality of pieces to minimize or eliminate downtime, thermal cycling and pressure cycling (see, column 1, lines 45-57). However, Carpenter et al. is silent on the axial length of each piece of liner apparatus 30 which is defined by the gradient temperature of deposition processor chamber 18. With respect to the axial length of each piece, the Examiner asserted that "[t]he combination of the AAPA and Carpenter et al. teaches that each of the plurality of pieces comprising the protection tube can vary in length" (see, the last paragraph on page 3 of the Office Action). Applicants stress that

the Examiner's assertion is not supported by the references because there is no such teaching in the AAPA and Carpenter et al.

In rejecting claim 3, now recited in independent claim 1, the Examiner applied *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987), and asserted that "[t]he pieces would be capable of being arranged in accordance with any gradient in temperatures generated by the plasma" (see, the last paragraph on page 3 of the Office Action). Then, the Examiner concluded that the limitation "each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures at the time of the plasma processing is smaller" does not differentiate the claimed invention from the prior art.

Applicants submit that the holding of *Ex parte Masham* is clearly distinguishable from the pending rejection based on the combination of the AAPA and Carpenter et al. Applicants invite the Examiner's attention to the last paragraph of *Ex parte Masham*, which states "[b]ased upon the foregoing, we agree with the examiner's position that the recitation 'completely submerged in the developer material' does not impose any structural limitations upon the claimed apparatus which differentiates it from that disclosed by Williams."

The issue in *Ex parte Masham* is whether usage of a material claimed is a structural limitation or not. The Board clearly states that "a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of that claimed." *id.* at 1648 (*citing In re Rishoi*, 197 F.2d 342, 94 USPQ71 (CCPA 1952) and *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935)) (emphasis added).

Claim 1 neither recites how to use any material, nor the function of the protection tube. Claim 1 structurally define a plasma processing apparatus in which the axial length of each piece

of the protection tube is defined by the gradient temperatures of the chamber at the time of the plasma processing. Applicants respectfully invite the Examiner's attention to the claimed limitation "each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures at the time of the plasma processing is smaller." This limitation structurally clearly defines a plasma processing apparatus, which is entitled to be given patentable weight.

Accordingly, at a minimum, the applied combination of the AAPA and Carpenter et al. does not teach or suggest, among other things, that "each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures at the time of the plasma processing is smaller," recited in independent claim 1, as amended. With the axial length of each pieces, a plasma processing apparatus recited in claim 1 is capable of avoiding breakage of the protection tube. This is a significant advantage which the applied combination does not provide.

Second, there is no motivation to modify the AAPA based on the teachings of Carpenter et al. to arrive at the claimed invention. As mentioned above, Carpenter's liner apparatus comprises the plurality of liner pieces to allow easy replacement of the linear apparatus. Carpenter et al. does not teach protecting an inner wall of a plasma chamber from temperature gradient or breakage. In addition, as discussed above, the Examiner overlooked that Carpenter et al. does not teach the positional relationship between the protection tube and the plasma chamber, as claimed.

Accordingly, Applicants stress that Carpenter et al. does not provide any support to justify the Examiner's position that a person skilled in the art would have been motivated to modify the AAPA to arrive at the claimed invention.

Based upon the foregoing, Applicants submit that the applied combination of the AAPA and Carpenter et al. does not disclose or suggest a plasma processing apparatus including all the limitations recited in independent claim 1, as amended. Applicants also submit that there is no motivation to modify the AAPA to arrive at the claimed invention. Dependent claims 2 and 6-8 are also patentably distinguishable over the AAPA and Carpenter et al. at least because they respectively include all the limitations recited in independent claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of claims 1, 2 and 6-8 under 35 U.S.C. §103(a) and favorable consideration thereof.

IV. The Rejection of Claims 4 and 5 under 35 U.S.C. §103(a)

Claims 4 and 5 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA in view of Carpenter et al. and further in view of Carducci et al.

In response, it is submitted that the applied combination does not teach or suggest a plasma processing apparatus including all the limitations recited in claims 4 and 5, at least because they include all the limitations recited in independent claim 1, as amended.

Applicants specifically note that Carducci et al. does not teach the protection tube recited in claim 1, and thus, does not cure the deficiency of the applied combination of the AAPA and Carpenter et al. Carducci's liner 118 has circumferential grooves 1805 and longitudinal grooves 1810, as shown in Fig. 20. With the presence of circumferential grooves 1805, liner 118 is not uniform in thickness in a direction of temperature gradient, i.e., in the direction of the axis of the protection tube. Such non-uniform thickness makes liner 118 more vulnerable to a thermal damage, which contradicts the object of the claimed invention.

Accordingly, the claimed invention would not have been obvious, and withdrawal of the rejection of claims 14 and 15 is respectfully solicited.

V. The Rejection of Claims 9-13 and 16-21 under 35 U.S.C. §103(a)

Claims 9-13 and 16-21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA in view of Carpenter et al., and further in view of Kennedy et al. It is noted that the rejection of claim 13 has been rendered moot by cancellation of the claim.

With respect to independent claim 11, Applicants submit that the applied combination of the AAPA, Carpenter et al. and Kennedy et al. does not disclose or suggest, among other things, the axial length of each piece of the protection tube which is defined by the gradient temperatures of the chamber at the time of the plasma processing (see, the discussion on the rejection of independent claim 1).

Even if it is assumed for the sake of this response that Kennedy et al. teaches inserting the protection tube into the sample chamber, the applied combination does not teach a plasma processing apparatus including all the limitations recited in claim 11. This is so because (1) the applied combination of the AAPA and Carpenter et al. does not teach or suggest the positional relationship between each piece of the protection tube and the plasma chamber (the sample chamber); and there is no motivation to modify the AAPA based on Carpenter et al. (see, the discussion on the rejection of claim 1). In addition, a plasma processing apparatus recited in claim 11 is capable of avoiding breakage of the protection tube. This is a significant advantage which the applied combination does not provide.

Accordingly, the applied combination of the AAPA, Carpenter et al. and Kennedy et al. does not disclose or suggest all the limitation recited in independent claim 11, as amended.

Dependent claims 9, 10, 12 and 16-21 are also patentably distinguishable over the AAPA, Carpenter et al. and Kennedy et al. at least because those claims respectively include all the limitations recited in independent claims 1 and 11. Applicants, therefore, respectfully solicit withdrawal of the rejection of claims 9-12 and 16-21 under 35 U.S.C. §103(a) and favorable consideration thereof.

VI. The Rejection of Claims 14 and 15 under 35 U.S.C. §103(a)

Claims 14 and 15 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the AAPA in view of Carpenter et al., and further in view of Kennedy et al., and further in view of Carducci et al.

In response, it is submitted that the applied combination does not teach or suggest a plasma processing apparatus including all the limitations recited in claims 14 and 15, at least because they include all the limitations recited in independent claim 11, as amended. Applicants note that Carducci et al. does not teach the protection tube recited in claim 11, and thus, does not cure the deficiency of the applied combination of the AAPA, Carpenter et al. and Kennedy et al. (see, the discussion on the rejection of claims 4 and 5).

Accordingly, withdrawal of the rejection of claims 14 and 15 is respectfully solicited.

VII. New Claims 22 and 23

New claims 22 and 23 are patentably distinguishable over the cited references at least because these claims respectively include all the limitations recited in independent claims 1 and 11. Applicants specifically note that loosely coupling the pieces as claimed in new claims 22 and 23 allows each piece to expand independently because each piece is exposed to a

temperature different from that of another piece in the chamber. This prevents the protection tube from damages to be caused by terminal stress and fatigue.

VIII. Conclusion

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Michael E. Fogarty
Registration No. 36,139

Please recognize our Customer No. 20277 as our correspondence address.

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 MEF:TT
Facsimile: 202.756.8087
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